



INL has begun converting its fleet of 80 biodiesel buses so they use an alternative fuel process called "dual fuel," whereby buses run on both biodiesel and natural gas at the same time.

INL dual-fuel buses reduce operating costs, carbon footprint

By Rick Bolton, *INL Communications & Governmental Affairs*

Idaho National Laboratory is not backing off its pursuit of environmentally friendly ways to operate the largest bus fleet in the Department of Energy complex.

Rather, INL has begun converting its fleet of 80 biodiesel buses so they use an even lower-cost alternative fuel process called "dual fuel," whereby buses run on both biodiesel and natural gas at the same time.

Converted INL buses are powered by a combination of biodiesel fuel (B20) and a form of natural gas, either LNG (liquefied natural gas) or CNG (compressed natural gas). Three buses were converted to burn LNG and biodiesel in the summer of 2013, and options are being pursued in order to convert more buses in the coming months.

A mass transit system was established for INL in 1953. Today, the lab uses 80 buses to transport 3,000 employees from their home communities to the 890-square-mile desert Site. The bus commute varies from less than 30 miles to more than 100 miles, with an average of 60 miles each way. The bus fleet travels 2.75 million miles per year.

INL leases most of its buses and light-duty vehicles from the General Services Administration, which provides light vehicles and economical fleet services to over 75 federal agencies.

INL's bus fleet reduces the number of passenger vehicles along with their carbon emissions, and increases passenger safety, especially during inclement winter weather when gusty winds create blowing snow hazards.

Use of bio-based components in INL's passenger bus fleet (B-20, or 20 percent biodiesel) and in its GSA-provided light-duty vehicles (E-85, or 85 percent ethanol) has moved the lab toward greater sustainability and less reliance on nonrenewable fossil fuels. Over the years, the lab's fleet management has been applauded with honors such as a White House GreenGov Award for reduced use of fossil fuels, increased use of alternative fuels and major mileage performance improvements.



Mechanics Matt Smith, Dennis Wohlschlegel and Bill Ziegler helped convert an initial three buses from biodiesel to dual fuel.



Hoses draw liquefied natural gas into an INL bus tank from an LNG fueling station pump.

The dual-fuel initiative is the next step in a never-ending pursuit of cleaner, lower-cost, carbon-reduction alternatives for operating INL's bus and light-duty vehicle fleets.

With the largest national laboratory bus fleet in the country, INL takes pride in partnering with industry, including bus and vehicle manufacturers and alternative fuel companies, to test and pilot sustainable methods of operating fleets with less reliance on fossil fuels.

"We want to reduce fuel emissions and meet our sustainability goals while keeping costs down for INL and for employees who buy bus passes," said Scott Wold, the INL Mission Support Services director who leads fleet management initiatives.

Alternative fuel buses release far fewer emissions than their diesel or biodiesel counterparts.

INL's vision calls for its entire bus fleet to be converted from using strictly biodiesel to a combination of biodiesel and natural gas, and eventually converted entirely to natural gas.

The lab's project management office teamed with fleet management to make the dual-fuel conversion initiative happen. A project management study clarified why it would be in the best interest of Battelle Energy Alliance, INL's management and operations contractor, to move forward with

converting buses to using liquefied natural gas in a dual-fuel system.

Mechanics and technicians at INL's world-class Big Shop maintenance facility are capable of using a kit to convert buses from biodiesel to dual fuel. Pending DOE and GSA approval, intermediate-term plans call for INL to convert most or all of its 80 buses to dual fuel in the next few years and to begin leasing buses that run completely on natural gas.

In order for the dual-fuel concept to work for INL's bus fleet, a fueling station infrastructure needs to be in place. A private fuel vendor, Blu, built an LNG fueling station south of Idaho Falls that is used by INL's buses, and another fueling station is in the planning stages for neighboring Pocatello. Utah-based Blu is building a national network of LNG and CNG fueling stations for the trucking industry. In the very long term — once fueling infrastructure is in place — the goal is for INL to eventually convert its entire bus fleet to using strictly natural gas.

For INL, the decision whether to use LNG or CNG will be largely based on route characteristics, supporting infrastructure and availability. Besides a reduced carbon footprint, INL and the DOE could realize large cost savings by converting to dual-fuel buses, depending on market prices for natural gas fuel.

Once converted, the dual-fuel buses use about half biodiesel and half liquefied natural gas. This reduces INL diesel fuel use by 50 percent, and if the entire bus fleet were converted, would save the annual fuel equivalent of taking 42 passenger vehicles off the road.

"Each bus conversion costs about \$35,000, and even though it's expensive to convert the buses to dual fuel, fuel cost savings begin to pay back those costs immediately," Wold said. Add the cost savings to the huge reduced carbon footprint and it becomes clear why this project is moving full steam ahead.

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Mechanic Dennis Wohlschlegel works to convert an INL biodiesel bus to a dual-fuel process that uses both liquefied natural gas and biofuel.